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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 922,842	08 07 2001	Junichi Yamanouchi	003510-106	8656

7590 02 28 2003

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EXAMINER

SHOSHIO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/922,842

Applicant(s)

YAMANOUCHI ET AL.

Examiner

Callie E. Shosho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 7, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 4 recites an improper Markush group. It is suggested that in line 2, "and" is replaced with "or".

Similar suggestions are made in claim 6, line 2 which also recites improper Markush language.

(b) Claim 7 discloses the "molecular weight" of the ionic group containing water-insoluble polymer. The scope of the claim is confusing because it is not clear what molecular weight this refers to – number average molecular weight, weight average molecular weight, etc.

(c) Claim 20 recites an improper Markush group. It is suggested that in line 3 after "from" and before "hydrophobic", the phrase "the group consisting of" is inserted and that "and" is inserted between formula (S-8) and formula (S-9).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

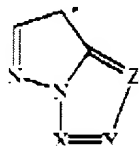
4. Claims 1-10, 12-14, 19-23, 25, 27, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Meyrick et al. (U.S. 6,235,096) taken in view of the evidence in Kiritani et al. (U.S. 4,665,411).

Meyrick et al. disclose ink jet ink and method of ink jet printing wherein the ink comprises 2-25 parts polyester which contains pendant carboxylic acid groups in an amount of 0.075-1 mmol/g and possesses molecular weight of 500-30,000, up to 60 parts solvent which comprises 17-50% hydrophobic high boiling point solvent such as dibutyl phthalate, and 0.5-10 parts oil-soluble dye. Given that the polyester contains carboxylic acid groups, it is clear that the polyester is inherently self-emulsifiable. Additionally, it is disclosed that the above inks are used in ink jet printer and then printed onto substrate. There is also disclosed a method for producing the ink by mixing dissipated polyester, i.e. polyester which has been dissipated by adding water to organic solvent solution of polyester, with dye/solvent solution, i.e. colored fine particle dispersion. Given that the polymer is mixed with the dye, it is clear that the polymer would inherently coat the dye as presently claimed (col.1, lines 3-4, col.7, lines 26-50, col.8, lines 18-

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27, col.9, lines 28-32, col.12, lines 37-41, col.13, lines 1-4 and 36-39, col.14, lines 24-26 and 38, col.14, line 66-col.15, line 7, col.15, line 23, and col.16, lines 9-11). Based on the above amounts, it is calculated that the ink comprises approximately 0.53-83% dye, 2.8-98% polymer, and 17-50% high boiling solvent. Although there is no explicit disclosure of the dielectric constant of the solvent, it is well known, as evidenced in Kiritani et al. (col.3, line 41), that dibutyl phthalate has dielectric constant of 6.4

The oil-soluble dye has the formula $Y^1=X^1-B-NR^1R^2$ where B is phenylene group such that presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ where R^6 and R^7 are each hydrogen and presently claimed R^2 and R^3 are each hydrogen, R^1 , which corresponds to presently claimed R^4 , is alkyl group, R^2 , which corresponds to presently claimed R^5 , is hydrogen, alkyl, or aryl group, X^1 is N, and Y^1 is:



where Z is N and X and Y are independently N or $C-R^{21}$ where R^{21} is hydrogen, alkyl, or aryl group.

In light of the above, it is clear that Meyrick et al. anticipate the present claims.

5. Claims 1, 3-6, 8-11, 19-23, 25, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Yao (U.S. 4,246,154) taken in view of the evidence in Kiritani et al. (U.S. 4,665,411).

Yao discloses ink jet ink and method of ink jet recording wherein the ink comprises vinyl polymer obtained from monomer including 1-8% carboxylic acids and colored fine particle dispersion comprising oil-soluble dye and hydrophobic high-boiling point organic solvent such as dibutyl phthalate or tricresyl phthalate. Given that the vinyl polymer contains carboxylic acid groups, it is clear that the polymer is inherently self-emulsifiable. There is also disclosed a method for preparing the ink by adding aqueous suspension of polymer to solution of dye/solvent. Given that the polymer is mixed with the dye, it is clear that the polymer would inherently coat the dye as presently claimed (abstract, col.1, lines 6-7 and 42-46, col.2, lines 38-40, 58-59, and 61-65, col.9, lines 3-5 and 7-10, and col.10, lines 25-30 and 40-55). It is calculated from polymer 1 (Table in col.6), for instance, that the polymer contains 0.93 mmol/g ionic group $((8 \text{ g methacrylic acid} / 86 \text{ g/mol (MW methacrylic acid)}) \times 1000 \text{ mmol/mol}) / 100\text{g}$

Attention is drawn to example 3 which discloses ink comprising 5% dye, 100% (based on the weight of dye) hydrophobic solvent, 16% polymer, and approximately 12% (20/165) coloring particulate dispersion (dye and hydrophobic solvent) which comprises 50% hydrophobic solvent.

Although there is no explicit disclosure of the dielectric constant of the solvent, it is well known, as evidenced in Kiritani et al. (col.3, line 41), that dibutyl phthalate has dielectric constant of 6.4.

In light of the above, it is clear that Yao anticipates the present claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
8. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyrick et al. (U.S. 4,246,154) or Yao (U.S. 6,235,096) in view of Kabalnov (U.S. 6,342,094).

The disclosures with respect to Meyrick et al. and Yao in paragraphs 4 and 5 above are incorporated here by reference.

The difference between Meyrick et al. or Yao and the present claimed invention is the requirement in the present claims of the average particle diameter of the colored fine particles.

Kabalnov, which is drawn to ink jet inks, disclose colored fine particles which have average particle size of 50-300 μm in order to produce ink with highlighter smearfastness, waterfastness, and smear resistance (col.4, line 66-col.5, line 2 and col.7, lines 51-60).

In light of the motivation for using colored fine particle with specific particle size disclosed by Kabalnov, it therefore would have been obvious to one of ordinary skill in the art to use colored fine particles with such particle size in the ink of Meyrick et al. or Yao in order to produce ink with good waterfastness and smear resistance, and thereby arrive at the claimed invention.

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyrick et al. (U.S. 6,235,096) or Yao (U.S. 4,246,154) either of which in view of Idei et al. (U.S. 5,302,437).

The disclosures with respect to Meyrick et al. and Yao in paragraphs 4 and 5 above are incorporated here by reference.

The difference between Meyrick et al. or Yao and the present claimed invention is the requirement in the present claims of substrate which has ink-receiving layer containing porous inorganic pigment.

Idei et al., which is drawn to ink jet recording sheet, disclose that when ink jet recording is carried out on non-coated, i.e. plain, paper, the images are low in colorfulness, clarity, printed dot density, and image density resulting in a deterioration of dot shape, feathering, and strike-through. Idei et al. also disclose that when ink jet recording is carried out on coated paper, the

colorfulness, clarity, feathering, and strike-through are improved as compared to recording on non-coated paper. The coated paper includes paper or transparent film having a silica coating (col.3, lines 15-42 and 57-66 and col.4, lines 54-57).

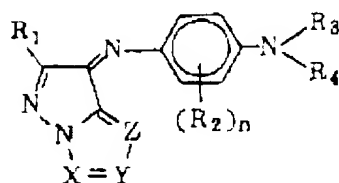
In light of the motivation for using coated paper as compared to plain paper disclosed by Idei et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use coated paper having a silica coating as the printing medium in Meyrick et al. or Yao in order to produce a printed image which has good colorfulness and clarity as well as little feathering or strike-through, and thereby arrive at the claimed invention.

10. Claims 12-14 and 27 rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of either JP 03231975 or JP 09059552.

The disclosure with respect to Yao in paragraph 5 above is here by reference.

The difference between Yao and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

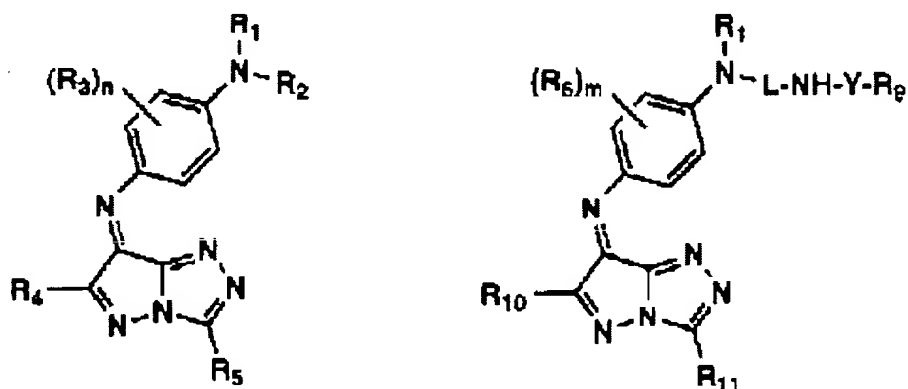
JP 03231975, an English translation of which is included in this office action, is drawn to ink jet ink and discloses an oil-soluble dye of the formula:



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wherein R_3 and R_4 , which correspond to presently claimed R^4 and R^5 , are each hydrogen, alkyl, cycloalkyl, aralkyl, or aryl group, R_2 , which corresponds to presently claimed R^2 , R^3 , R^6 , and R^7 are each hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, R_1 , which corresponds to presently claimed R^1 , is hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, presently claimed X^1 and Y are independently either $-CR_5=$ or $-N=$, where R_5 is hydrogen or alkyl, aryl, or heterocyclic, group, and presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ wherein R^6 and R^7 are defined above (abstract, claim 1, page 7, pages 18-25). The motivation for using such dye is to produce a printed image with good hue (page 5, first full paragraph).

Alternatively, JP 09059552, an English translation of which is included in this office action, which is drawn to ink jet ink, disclose the use of oil-soluble dyes of the formula:



wherein R_1 and R_2 , corresponding to presently claimed R^4 and R^5 , are hydrogen, aliphatic, aromatic, or heterocyclic group, L is alkylene group, Y is carbonyl or sulfonyl group, R_9 is aromatic, aliphatic, heterocyclic, alkoxy, or amino group, R_3 or R_6 , which each correspond to

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either presently claimed R^2 , R^3 , R^6 , and R^7 are hydrogen, halogen, alkoxy, aryl, carboxyl, or amino group, R_4 or R_{10} , which each correspond to presently claimed R^1 , are aliphatic, aromatic, heterocyclic, alkoxy, sulfonyl, or amino group, presently claimed X^1 is $-CR_5=$ or $-CR_{11}=$, which each correspond to presently claimed $-C(R^8)=$, where R_5 or R_{11} is hydrogen, aliphatic, or aromatic group, presently claimed Y is $-N=$, and presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ wherein R^6 and R^7 are defined above (abstract, claim 1, claim 3, and paragraphs 9, 16, 24-30, and 39-56). The motivation for using such dye in the ink composition is that the dye produces a printed image that has excellent color tone, reproducibility, and resistance to light (paragraph 7).

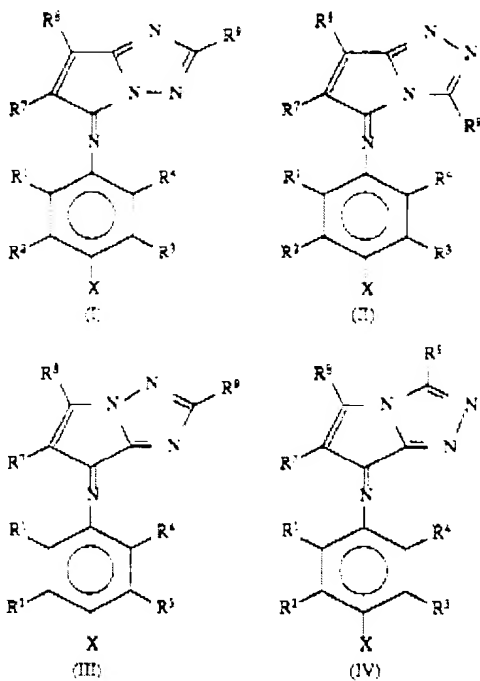
In light of the motivation for using specific type of oil-soluble dye disclosed by JP03231975 or JP 09059552, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Yao in order to produce an ink with good hue, or alternatively, excellent color tone, reproducibility, and resistance to light, and thereby arrive at the claimed invention.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of Suzuki et al. (U.S. 5,508,421).

The disclosure with respect to Yao in paragraph 5 above is incorporated here by reference.

The difference between Yao and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

Suzuki et al. disclose the use of oil-soluble dyes of the formula:



which are identical to the dyes presently claimed and wherein X is OH or NR⁵R⁶, R¹-R⁴ and R⁹, which corresponds to presently claimed R²⁰³, are hydrogen, alkyl, halogen, etc., R⁷, which corresponds to presently claimed R²⁰¹, is cyano, COR, etc., and R⁸, which corresponds to presently claimed R²⁰², is hydrogen, heterocyclic group, alkyl, aryl, cyano, etc. It is also disclosed that the dyes are suitable for use in inks (col.3, lines 38-67, col.4, lines 12-29, col.6, line 42-col.7, line 57, col.9, lines 12-52, col.10, lines 14-30, and col.13, lines 3-5 and 21-23). The motivation for using such dyes is that they possess high absorption and high fastness to light and heat (col.2, lines 7-10 and col.3, lines 14-21).

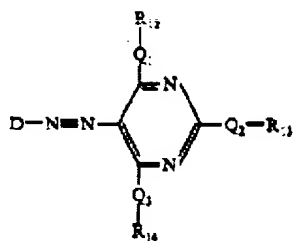
In light of the motivation for using specific type of oil-soluble dye disclosed by Suzuki et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Yao in order to produce an ink which possess high absorption and high fastness to light and heat, and thereby arrive at the claimed invention.

12. Claims 16-17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of either Petitpierre et al. (U.S. 4,101,541) or Dehnert et al. (U.S. 4,016,152)

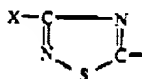
The disclosure with respect to Yao in paragraph 5 above is incorporated here by reference.

The difference between Yao and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

Petitpierre et al. disclose dye is of the formula :



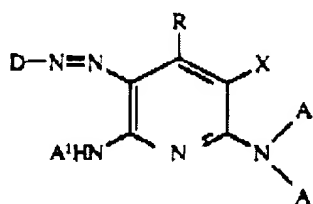
where D is:



wherein the dye is identical to dye presently claimed when presently claimed B^2 is $-CR^2=$ where R^2 is amino group, B^1 is nitrogen atom, G is amino group, and R^5 and R^6 are each hydrogen or alkyl group and wherein D corresponds to presently claimed formula (M-c) (col.1, lines 9-19 and 24-39, col.3, lines 41-66, col.7, lines 44-54, and col.14, line 67-col.15, line 1).

The motivation for using such dye is that it produces prints with good fastness properties (col.15, lines 5-6).

Alternatively, Dehnert et al. disclose dye of the formula:



which is identical to dye presently claimed when presently claimed B^1 is $=C(R^1)-$ and B^2 is $-C(R^2)=$ where R^1 is cyano or carbamoyl and R^2 is hydrogen or C_1-C_7 alkyl, R^5 and R^6 are bonded together to form heterocyclic ring, and G is amino group and wherein D is thiazole or benzothiazole which correspond to presently claimed formula (M-b) and (M-c) (col.1, lines 9-29).

The motivation for using such dye is to obtain deep shades which have excellent fastness properties especially to heat and light (col.10, lines 57-59).

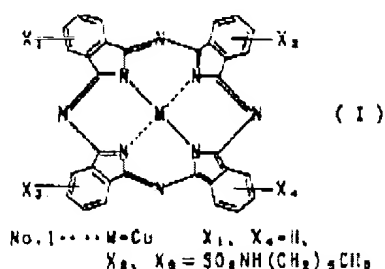
In light of the motivation for using specific type of oil-soluble dye disclosed by Petitpierre et al. or Dehnert et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Yao in order to produce ink with good fastness properties, and thereby arrive at the claimed invention.

13. Claims 18 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of JP 01095093.

The disclosure with respect to Yao in paragraph 5 above is incorporated here by reference.

The difference between Yao and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

Pending translation, it is noted that JP 01095093, which is drawn to ink jet ink, discloses oil-soluble dye of the formula:



wherein the motivation for using such dye is to produce ink with good clarity and fading resistance on exposure to light (abstract and page 2, right column, last paragraph).

In light of the motivation for using specific type of oil-soluble dye disclosed by JP 01095093 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Yao in order to produce ink with good clarity and fading resistance, and thereby arrive at the claimed invention.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Onodera et al. (U.S. 5,753,017) disclose ink jet ink comprising polymer and dye identical to that presently claimed, however, there is no disclosure of hydrophobic solvent as presently claimed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho

Callie E. Shosho
Examiner
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CS
2/22/03